UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUN 16 2004

Ms. Mimi Drew, Director
Division of Water Resource Management
Florida Department of Environmental Protection
Twin Towers Office Building
Mail Station 3500
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Ms. Drew:

The Environmental Protection Agency has completed its review, as documented in the enclosed memorandum, of the Site Specific Alternative Criteria (SSAC) for Dissolved Oxygen (DO) in the Everglades Protection Area. The SSAC was adopted by final order and became effective on January 26, 2004. The adopted SSAC was submitted to the Environmental Protection Agency for review by Teri L. Donaldson, General Counsel of the Florida Department of Environmental Protection (FDEP), by letter dated March 3, 2004. The submittal letter included the required certification stating that the SSAC is a valid and final order of the Department and not subject to any appeal.

The Everglades DO SSAC establishes a revised water quality criteria for the Everglades Protection Area (Water Conservation Areas 1, 2A, 2B, 3A, and 3B, the Arthur R. Marshall National Wildlife Refuge, and the Everglades National Park), which remains classified and protected for all designated uses of Class III waters, including recreation, and propagation and maintenance of a healthy, well-balanced population of fish and wildlife. The revised criterion is based on an algorithm developed by FDEP that models the observed sinusoidal diel cycle and seasonal variability and provides a protective lower DO limit for individual monitoring stations.

Based on our review of the supporting information as provide by FDEP for the Everglades DO SSAC, it is the Environmental Protection Agency's conclusion that the requirements of the Clean Water Act and provisions of 40 CFR Part 131 have been met. Therefore based on the authorities of Section 303(c) of the Clean Water Act, I am approving the Everglades DO SSAC as a revision to Florida water quality standards.

If you have any questions, concerning this action, please do not hesitate to call me at (404) 562-9470, or Gail Mitchell, Chief of the Standards, Monitoring and Total Maximum Daily Load Branch at (404) 562-9234.

Sincerely,

James D. Giattina, Director
Water Management Division

Enclosure

cc: Teri L. Donaldson, FDEP
Stacey Cowley, FDEP
Jerry Brooks, FDEP
Frank Nearhoof, FDEP
Greg Knecht, FDEP
Kenneth Weaver, FDEP
Eric Shaw, FDEP
Lorraine Heisler, USFWS
Kalani Cairns, USFWS

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June 9, 2004

TO: Gail Mitchell, Chief
Standards, Monitoring, and TMDL Section

THRU: Andrew Bartlett, Chief
East Standards, Monitoring, and TMDL Section

FROM: Cecelia Ann Harper, Environmental Scientist
East Standards, Monitoring, and TMDL Section

SUBJECT: Review of Site Specific Alternative Criteria for Dissolved Oxygen in the Everglades Protection Area

Review of the state of Florida's revised water quality criterion submittal for dissolved oxygen (DO) in the Everglades Protection Area as defined in Florida Statute, Section 373.4592(2)(h) is complete. The revised criterion was submitted by letter dated March 3, 2004; signed by Teri L. Donaldson, General Counsel of the Florida Department of Environmental Protection Agency (FDEP) and addressed to James Palmer, Region Administrator, U.S. Environmental Protection Agency (EPA) Region 4. The aforementioned letter included certification that the revision to Florida water quality standards "is a valid and final order of the Department, and not subject to any appeal."

Florida's action to revise the DO criterion for the Everglades Protection Area was established by Final Order on January 26, 2004 as a site specific alternative criteria (SSAC).

The Class III water quality criterion modified by the SSAC is contained in the Florida Administrative Code (F.A.C.) 62-302.530(31), and states that DO:

> "Shall not be less than 5.0 mg/L ~~in a 24-hour period and shall never be less than 4.0~~. Normal daily and seasonal fluctuations above these levels shall be maintained."

The F.A.C. Section 62-302.800 titled Site Specific Alternative Criteria, includes the following requirements for the development of a DO SSAC:

> (1) A water body, or portion thereof, may not meet a particular ambient water quality criterion specified for its classification, due to natural background conditions . . . . In such circumstances, and upon petition by an affected person or upon the initiation by the Department, the Secretary may establish a site specific alternative water quality

criterion when an affirmative demonstration is made that an alternative criterion is more appropriate for a specified portion of waters of the state. Public hearing and an opportunity for public hearing shall be provided prior to issuing any order establishing alternative criteria.

(a) The affirmative demonstration required by this section shall mean a documented showing that the proposed alternative criteria would exist due to natural background conditions...Such demonstration shall be based upon relevant factors which include:

1. A description of the physical nature of the specified water body and the water pollution sources affecting the criterion to be altered.

2. A description of the historical and existing water quality of the parameter of concern including, spatial, seasonal, and diurnal variations, and other parameters or conditions which may affect it. Conditions in similar water bodies may be used for comparison.

3. A description of the historical and existing biology, including variations, which may be affected by the parameter of concern. Conditions in similar water bodes may be used for comparison.

4. A discussion of any impacts of the proposed alternative criteria on the designated use of the waters and adjoining waters.

The revision to the statewide criterion for DO was developed by FDEP using an algorithm that uses sample collection time and water temperature to model the observed natural sinusoidal diel cycle and seasonal variability. The model provides a lower dissolved oxygen limit for individual monitoring stations that will protect the designated use because a single value criterion does not adequately account for the wide natural daily (diel) fluctuations observed in the marsh. To fully account for seasonal and annual variability in marsh dissolved oxygen concentrations, ambient assessment with the SSAC was determined based on a comparison between the annual average of multiple DO measurements made throughout the year and the average of the corresponding DO limits specified by the above equation for that year. The model also allows differentiation between natural background DO conditions and areas with an "impaired" DO function. Specifically it correctly identifies and passes sites exhibiting natural background conditions while also correctly identifying sites exhibiting low DO levels resulting from nutrient enrichment, groundwater infiltration, or other anthropogenic impacts.

The provisions of the SSAC are as follows:

A model that provides a lower DO limit for an individual monitoring station is described by the following equation:

$$DOL_i = [-3.70 - [1.5 \cdot \sin(2\pi/1440 \cdot t_i) - (0.30 \cdot \sin(4\pi/1440 \cdot t_i))] + 1/(0.0683 + 0.00198 \cdot C_i + 5.24 \cdot 10^{-6} \cdot C_i^2)] - 1.1$$

Where: DOL_i is the lower limit for the i^{th} annual DO measurement in mg/L
t_i is the sample collection time of the i^{th} annual DO measurement
C_i is the water temperature associated with the i^{th} annual DO measurement in °C

The modeled lower DO limit is applicable to the Everglades Protection Area defined in Florida Statute, Section 373.4592(2)(h) which includes Water Conservation Areas 1, 2A, 2B, 3A, and 3B, the Arthur R. Marshall National Wildlife Refuge, and the Everglades National Park.

The technical basis for the SSAC was reviewed by Dan Scheidt of the EPA South Florida Office (see attached memorandum). The conclusion of his analysis is as follows:

1. Florida's 5.0 mg/L Class III criterion for dissolved oxygen does not reflect natural background conditions within the Everglades wetland system. It is common for DO to fall below 5.0 mg/L at Everglades reference sites.

2. The five reference stations within the interior of WCA2A that FDEP used to develop the DO SSAC for the Everglades Protection Area have been extensively studied and are known to represent natural conditions. This condition is confirmed by data for surface water total phosphorus (TP) and soil TP concentrations, along with indicators of biological balance such as aquatic macro invertebrates, periphyton, and macrophytes.

3. The DO SSAC developed by FDEP is based directly on natural conditions within the Everglades Protection Area. It incorporates consideration of the time of day and water temperature, and it directly reflects natural background conditions including temporal variability for DO in this wetland water body. Maintenance of this natural condition for DO, as defined by the SSAC, is expected to provide the same level of protection for the flora and fauna of the EPA as for other Class III waters of the State.

4. The DO SSAC includes an appropriate adjustment factor that will reduce the occurrence of type I errors (false positive violations of the criterion).

5. The DO SSAC includes a clearly defined methodology that describes how it is to be applied on an annual basis to individual marsh stations.

6. The DO SSAC has been subjected to external scientific peer review and it has been determined to be based on sound scientific rationale. No scientific concerns have been identified.

7. The DO SSAC meets the requirements of 40 CFR section 131.11 to protect the designated use of the water body and to be based on sound scientific rationale.

Lastly, current EPA guidance allows a State to establish water quality criteria based on naturally-occurring conditions in a water body that provides for full protection of the water body's aquatic life designated use. Specifically: "For aquatic life uses, where the natural

background concentration for a specific parameter is documented, by definition that concentration is sufficient to support the level of aquatic life expected to occur naturally at the site absent any interference by humans" (Tudor T. Davies, "Establishing Site Specific Aquatic Life Criteria Equal to Natural Background" memorandum dated November 5, 1997). Since the provisions of this SSAC establish scientifically defensible DO water quality criteria for the Everglades Protection Area as it occurs in background concentrations due only to non-anthropogenic sources, it is consistent with EPA's aforementioned guidance. By retaining the Class III use for the waters to which the DO SSAC applies, the designated uses for the Everglades Protection Area will continue to meet the requirement of Clean Water Act Section 101(a)(2).

With regard to consultation activities for Section 7 of the Endangered Species Act (ESA), EPA Region 4 has concluded that the Agency's action to approve the revision to Florida water quality standards will have "no effect" on listed species or their critical habitat. EPA has communicated the Agency's "no effect" decision with the U.S. Fish and Wildlife Service (FWS) via telephone and email. Although not required under ESA, it is expected that a concurrence from the FWS will be forthcoming.

Based on the analysis of the information submitted to EPA, it is the Agency's conclusion that the requirements of the Clean Water Act and 40 CFR Part 131 have been met, and approval of the Everglades Protection Area DO SSAC is appropriate.